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501.33745CX4/219400807US5

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Shunji MAEDA *et al.*
Appl'n No. : 10/686,584
Filed : 17 October 2003
For : MANUFACTURING METHOD OF SEMICONDUCTOR
SUBSTRATE AND METHOD AND APPARATUS FOR
INSPECTING DEFECTS OF PATTERNS OF AN
OBJECT TO BE INSPECTED
Art Unit : 2877
Examiner : Hoa Q. Pham
Conf. No : 9360

SUPPLEMENTAL PRELIMINARY AMENDMENT

Commissioner for Patents
POB 1450
Alexandria, Virginia 22313-1450

29 April 2004

Sir:

Prior to examination on the merits in the above-identified application, the following amendments and remarks are respectfully submitted.

In accordance with the revised format of the manner of making amendments under 37 CFR §1.121 as set forth in the Final Rule effective 30 July 2003, each section of amendment herein begins on a new page, and changes are shown by strike-through (or double brackets where appropriate) and underlining to indicate deletions and additions, respectively. A complete listing of all claims ever presented in the application is given with the current status of each claim, and only the text of all pending and withdrawn claims is presented in full, with those not being amended herein being presented in clean version.

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IN THE CLAIMS:

1.-42. (Canceled)

43. (Currently Amended) A method of inspecting a patterned wafer, comprising:

- emitting light containing a plurality of wavelengths from a light source;
- illuminating the patterned wafer with the light through a lens;
- detecting through the lens with a sensor, an image of a pattern on the patterned wafer as illuminated by the light, and outputting from the sensor, a signal concerning a detected image; and
- processing the signal outputted from the sensor and obtaining information of defects of the pattern;

wherein light components having a predetermined wavelength range as are selected from the light emitted from the light source for preventing interference of lights reflected from the wafer by the illuminating, and are used to illuminate the patterned wafer.

44. (Previously Presented) A method according to the Claim 43, wherein in the detecting, the image of the pattern is detected by a time delay integration sensor.

45. (Previously Presented) A method according to the Claim 43, wherein in the illuminating, the patterned wafer is illuminated with ultra violet light selected from the light emitted from the light source.

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46. (Previously Presented) A method according to the Claim 43, wherein in the illuminating, a wavelength selection filter selects the light components having a predetermined wavelength range of 600 nm or under from the light emitted from the light source.

47. (Currently Amended) A method of inspecting a patterned wafer, comprising:

illuminating a specimen through an objective lens with wavelength light having a predetermined wavelength range as selected from light having a plural wavelengths emitted from a light source for preventing interference of lights reflected from the wafer by the illuminating;

detecting with a time delay integration sensor, a light reflected from the patterned wafer by the wavelength light and passed through the objective lens; and
processing the output signal from the time delay integration sensor and obtaining information relating to a defect of the patterned wafer.

48. (Previously Presented) A method according to the Claim 47, wherein in the illuminating, the patterned wafer is illuminated with ultra violet light selected from the light emitted from the light source.

49. (Previously Presented) A method according to the Claim 48, wherein the time delay integration sensor outputs signals in parallel, and the signals outputted in parallel are processed in parallel in the processing operation.

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50. (Previously Presented) A method according to the Claim 47, wherein in the processing, the output signal from the time delay integration sensor is processed using a variable defect detection sensitivity which varies according to a position on the patterned wafer.

51. (Previously Presented) A method according to the Claim 47, wherein in the processing, the output signal from the time delay integration sensor is processed using a variable defect detection sensitivity which varies according to the pattern being inspected.

52. (Currently Amended) An apparatus for inspecting a patterned wafer, comprising:

a light source to emit light containing a plurality of wavelengths;

an illuminating unit to illuminate the patterned wafer with light emitted from the light source;

a detecting unit to detect an image of a pattern on the patterned wafer as illuminated by the illuminating unit, and to output a signal concerning a detected image; and

a processing unit to process the signal outputted from the detecting unit and to obtain information of defects of the pattern;

wherein, the illuminating unit selects predetermined light components having a predetermined wavelength range as selected from the light emitted from the light source for preventing interference of lights reflected from the wafer by the

illuminating, to illuminate the patterned wafer

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53. (Previously Presented) An apparatus according to the Claim 52, wherein the detecting unit detects the image of the pattern with a time delay integration sensor.

54. (Previously Presented) An apparatus according to the Claim 52, wherein the light source emits ultra violet light, and the illuminating unit selects the ultra violet light from the light emitted from the light source as the predetermined light components having a predetermined wavelength range.

55. (Previously Presented) An apparatus according to the Claim 52, wherein the light source is a lamp.

56. (Previously Presented) An apparatus according to the Claim 52, wherein the processing unit processes the signal outputted from the detecting unit with a variable defect detection sensitivity which varies according to a position on the patterned wafer.

57. (Previously Presented) An apparatus according to the Claim 52, wherein the processing unit processes the signal outputted from the detecting unit with a variable defect detection sensitivity which varies according to the pattern being inspected.

58. (Currently Amended) An apparatus for inspecting a patterned wafer,

comprising:

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a light source to emit light containing plural wavelengths;

an illuminating unit having an objective lens to illuminate the patterned wafer through the objective lens with wavelength light having a predetermined wavelength range as selected from the light emitted from the light source for preventing interference of lights reflected from the wafer by the illuminating;

a detecting unit to detect an image of the patterned wafer as illuminated by the illuminating unit through the objective lens, with a time delay integration sensor; and

a processing unit to process an output signal from the time delay integration sensor and to obtain information relating to a defect of the patterned wafer.

59. (Previously Presented) An apparatus according to the Claim 58, wherein the light source emits ultra violet light, and the illuminating unit selects the ultra violet light from the light emitted from the light source, to illuminate the patterned wafer.

60. (Previously Presented) An apparatus according to the Claim 58, wherein the illuminating unit includes a wavelength selection filter to select light components having a predetermined wavelength range of 600 nm or under from the light emitted from the light source, to illuminate the patterned wafer.

61. (Previously Presented) An apparatus according to the Claim 58, wherein the processing unit processes the signal outputted from the detecting unit with a variable defect detection sensitivity which varies according to a position on the patterned wafer.

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62. (Previously Presented) An apparatus according to the Claim 58, wherein the processing unit processes the signal outputted from the detecting unit with a variable defect detection sensitivity which varies according to the pattern being inspected.

63. (New) A method according to Claim 47, wherein a wavelength selection filter for selecting wavelengths from the light is disposed between the light source and the objective lens.

64. (New) A method according to Claim 47, wherein a wavelength selection filter for selecting the wavelength light is disposed between the light source and the objective lens.

65. (New) An apparatus according to Claim 52, comprising a wavelength selection filter disposed between the light source and the objective lens selects the predetermined light components.

66. (New) An apparatus according to Claim 58, comprising a wavelength selection filter disposed between the light source and the objective lens selects the wavelength light.

67. (New) An apparatus for inspecting a patterned wafer, comprising:
a light source to emit light containing a plurality of wavelengths;

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a non-interference light selector including a filter to select predetermined wavelengths from the light emitted from the light source for preventing interference of lights reflected from the wafer, to illuminate the patterned wafer;

an objective lens to pass the predetermined wavelengths from the non-interference light selector to the patterned wafer;

a detecting unit to detect an image of a pattern on the patterned wafer as illuminated by the predetermined wavelengths and reflected back through the objective lens, and to output a signal concerning a detected image; and

a processing unit to process the signal outputted from the detecting unit and to obtain information of defects of the pattern.

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REMARKS

This Supplemental Preliminary Amendment presents amendments as identified above, and information as indicated below.

PENDING CLAIMS

Original Claims 1-42 were previously canceled without prejudice or disclaimer of any scope or subject matter, and new Claims 43-62 were presented. Appropriate claims have been amended and added herein to adjust a clarity and/or focus of Applicant's claimed invention. That is, such changes are unrelated to any prior art or scope adjustment, and are simply refocused claims in which Applicant is present interested. At entry of this paper, Claims 43-67 are pending for consideration and examination in the application.

RESERVATION OF RIGHTS

It is respectfully submitted that any and all claim amendments and/or cancellations submitted within this paper and throughout prosecution of the present application are without prejudice or disclaimer of any scope or subject matter. Further, Applicant respectfully reserves all rights to file subsequent related application(s) (including reissue applications) directed to any/all previously claimed limitations/features which have been subsequently amended or cancelled, or to any/all limitations/features not yet claimed, *i.e.*, Applicant continues (indefinitely) to maintain no intention or desire to dedicate or surrender any limitations/features of subject matter of the present application to the public.

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EXAMINER INVITED TO TELEPHONE

The Examiner is invited to telephone the undersigned at the local D.C. area number of 703-312-6600, to discuss an Examiner's Amendments or other suggested action for accelerating prosecution and moving the present application to allowance.

CONCLUSION

In view of the foregoing amendments and remarks, Applicant respectfully submits that the claims listed above as presently being under consideration in the application are in condition for allowance. Accordingly, early allowance of such claims is respectfully requested.

This Supplemental Preliminary Amendment is submitted prior to a first Action on the merits and does not interfere with preparation of such an Action, and therefore is timely. No Petition or fee is possible for entry of this paper.

Respectfully submitted,



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Patent Dkt. No. 501.33745CX4 Attorney Initials PJS:pjj
Application No. 10/686,584 Filing Date 17 October 2003
Applicant(s) Shunji MAEDA et al.
Papers Filed Herewith on 29 April 2004

Receipt is hereby acknowledged of the papers filed as indicated by the checked items in connection with the above-identified application:

☐ New Application Transmittal Form ☒ Credit Card Payment Form PTO-2038
 Pages of Specification (claims) Fees \$306 (Codes 1460/1201/1202)
 Sheets of Drawings ☒ Amendment-Suppl. Prelim.
☐ Declaration (pages) ☐ Response to Office Action
☐ Fee Transmittal Form ☐ Petition for Extension of Time (mos.)
☐ Claim for Priority ☐ Information Disclosure Statement
 ☐ Priority Documents ☒ PTO-1449 ☒ Copies of References-6
☐ Assignment Papers ☐ Revised Drawings (sheets)
☐ Issue Fee Transmittal ☐ Notice of Appeal
☒ Other Pet. to Make Special for Special Accelerated Exam. Under
MPEP §708.02(VIII); Form PTO-1449/5 US Refs./1 JP Ref. and
English Abstract; Supplemental Preliminary Amendment; and
Form PTO-2038 (Fee Codes 1460/1201/1202) - \$306

